

What is claimed is:

1. In a circular, singly linked list having a first member having a first member next pointer field, a current pointer register and a root pointer register, a method for adding a new member to the list at an arbitrary location during a scan operation, comprising:
  - copying a root pointer included in the root pointer register to a new member next pointer field associated with the new member such that the new member next pointer field points to the first member; and
  - overwriting the root pointer register with a new member root pointer such that the root pointer register points to the new member.
2. A method as recited in claim 1, wherein the first member includes a first content field suitable for storing a data field.
3. A method as recited in claim 2, wherein the data field stored in the current content field is read by a consumer during the list scan operation.
4. A method as recited in claim 1, wherein the addition requires only a single memory access operation.
5. A method as recited in claim 1, further comprising:
  - once the new member has been added to the list,
  - if the root pointer is not NULL, then reading the current pointer register to obtain the next pointer;
  - if the next pointer is not NULL, the setting a current pointer to the next pointer.
6. A method as recited in claim 5, further comprising:
  - if the current pointer is NULL, and
  - if the root pointer is NULL, then setting the list as an empty list,

if the root pointer is not NULL, then setting the current pointer to the root pointer.

7. A method as recited in claim 5,  
if the next pointer is NULL, then  
if the root pointer is NULL, then setting the list as an empty list,  
if the root pointer is not NULL, then setting the current pointer to the root pointer.

8. In a circular, singly linked list having a first member having a first member next pointer field, a current pointer register and a root pointer register, an apparatus for adding a new member to the list at an arbitrary location during a scan operation, comprising:

a means for copying a root pointer included in the root pointer register to a new member next pointer field associated with the new member such that the new member next pointer field points to the first member; and

a means for overwriting the root pointer register with a new member root pointer such that the root pointer register points to the new member.

9. An apparatus as recited in claim 8, wherein the first member includes a first content field suitable for storing a data field.

10. An apparatus as recited in claim 9, wherein the data field stored in the current content field is read by a consumer during the list scan operation.

11. An apparatus as recited in claim 8, wherein the addition requires only a single memory access operation.

12. An apparatus as recited in claim 8, further comprising:  
a means for determining if a current pointer is not NULL;

a means for reading the current pointer register to obtain the next pointer when the current pointer is not NULL;

a means for determining if the next pointer is not NULL; and

a means for setting the current pointer to the next pointer.

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13. An apparatus as recited in claim 12, further comprising:

a means for determining if the current pointer is NULL;

a means for determining if the root pointer is NULL;

a means for setting the list as an empty list when the current pointer

10 and the root pointer are NULL; and

a means for setting the current pointer to the root pointer when the root pointer is not NULL.

14. An apparatus as recited in claim 12, further comprising:

a means for determining if the next pointer is NULL;

a means for setting the list as an empty list when the root pointer is NULL; and

a means for setting the current pointer to the root pointer when the root pointer is not NULL.

15. A computer program product for adding a new member to the list at an arbitrary location during a scan operation in a circular, singly linked list having a first member having a first member next pointer field, a current pointer register and a root pointer register, comprising:

computer code for copying a root pointer included in the root pointer register to a new member next pointer field associated with the new member such that the new member next pointer field points to the first member; and

computer code for overwriting the root pointer register with a new member root pointer such that the root pointer register points to the new member; and

a computer-readable medium that stores the computer codes.

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16. A computer program product as recited in claim 15, wherein the first member includes a first content field suitable for storing a data field.

17. A computer program product as recited in claim 16, wherein the data field stored in the current content field is read by a consumer during the list scan operation.

18. A computer program product as recited in claim 15, wherein the addition requires only a single memory access operation.

19. An apparatus as recited in claim 18, further comprising:  
computer code for determining if a current pointer is not NULL;  
computer code for reading the current pointer register to obtain the next pointer when the current pointer is not NULL;  
computer code for determining if the next pointer is not NULL;  
computer code for setting the current pointer to the next pointer;  
computer code for determining if the current pointer is NULL;  
computer code for determining if the root pointer is NULL;  
computer code for setting the list as an empty list when the current pointer and the root pointer are NULL;  
computer code for setting the current pointer to the root pointer when the root pointer is not NULL;  
computer code for determining if the next pointer is NULL;  
computer code for setting the list as an empty list when the root pointer is NULL; and  
computer code for setting the current pointer to the root pointer when the root pointer is not NULL.